

CLAIMS

1. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact, said energy absorber comprising a unitary structure comprising a molded mat of fiber reinforced resin material, said structure having a crushable forward projecting portion adapted to crush upon impact.
2. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 1 wherein said energy absorber has an elongated shape and is adapted for mounting to the forward end of a vehicle for extending longitudinally across the width of the vehicle.
3. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 2 wherein said energy absorber is adapted for pedestrian leg protection and has a highly efficient crush mode.
4. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 2 is adapted to reduce forces of impact with legs of a pedestrian.
5. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 2 wherein the energy absorber is adapted to absorb energy during an impact of said vehicle at low speeds of less than or equal to 5Mph.
6. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 2 said energy absorber consist essentially of a single integral unit of thermoformed or compression molded material.
7. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 6 wherein said forwardly projecting portion comprises a plurality of forwardly projecting crushable lobes.
8. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 7 wherein said energy absorber includes a support portion for said crushable lobes, said support portion being adapted for attachment to bumper beam.
9. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 8 wherein said plurality of crushable lobes extend

outwardly from the support portion, each of said lobes having a forwardly facing front wall, at least a pair of adjacent lobes having interconnecting front walls.

10. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 9 wherein each crushable lobe comprise a crush initiating portion comprising a portion of said lobe having a different cross sectional area than another portion of said lobe.

11. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 10 wherein said crush initiating portion comprises a conically shaped portion.

12. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 10 wherein said plurality of the crush means are attached longitudinally across the front of the support portion.

13. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 10 wherein said plurality of crushable lobes project forwardly and are spaced apart longitudinally across said support portion.

14. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 13 wherein said energy absorber comprises a low density glass mat thermoplastic composite.

15. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 14 wherein as determine by the weight of a square meter of said glass mat thermoplastic composite wherein the glass mat has a weight of about 600 to about 3000 grams per square meter.

16. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 7 wherein and said energy absorber is compression molded or thermoformed.

17. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 16 wherein the energy absorber is compression molded.

18. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 17 wherein said energy absorber comprises fiber reinforcement in a matrix of thermoplastic material.

19. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 18 wherein said mat is formed by heating a thermoplastic polymer to bind fibers in said mat.

20. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 19 wherein said mat comprises a chopped glass fibers and a thermoplastic binder material.

21. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 20 wherein said thermoplastic polymer of the glass mat comprises polyolefin, a polyester resin, a polycarbonate, or mixtures thereof.

22. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 21 wherein said polyester is a polyalkylene terephthalate.

23. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 22 wherein said polyester is polybutylene terephthalate and said polycarbonate is an aromatic polycarbonate.

24. An energy absorber adapted for attachment to a vehicle for absorbing forces generated from an impact according to claim 20 wherein said energy absorber is interdisposed between the fascia and reinforcing bumper beam, said vehicle bumper being attachable to the front of an automotive vehicle, said fascia enveloping the energy absorber and reinforcing beam such that neither component other than the fascia is visible once attached to the vehicle.